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PATIENT-NURSE DEPENDENCY
ORTHOPAEDIC SURGERY

*Issued by the Research and Planning Unit
of the Department of Health
Wellington, New Zealand*



1965



DEPARTMENT OF HEALTH

PATIENT-NURSE DEPENDENCY ORTHOPAEDIC SURGERY

An Analysis of Survey Data from Three Public Hospitals in Christchurch 1962

by

THE RESEARCH AND PLANNING UNIT
(formerly the Operational Research Unit)

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*New Zealand. Dept. of Health,
Series*

SPECIAL REPORT No. 21

*Issued by the Research and Planning Unit
Department of Health, Wellington
January 1965*

FOREWORD

by Dr H. B. Turbott, I.S.O., M.B., Ch.B., D.P.H.,
Director-General of Health

This report is one of a series concerned with a survey of patient nurse dependency made in three hospitals administered by the North Canterbury Hospital Board by the Operational Research Unit with the active co-operation of the Board.

In general each report covers a clinical specialty. Since it deals with only part of the survey data it is best considered with others in the series. The information in the report is of wide interest and I hope it will help many hospital administrators.

Reports already published have shown the worth of operational research methods in hospital planning and organisation. In this important work of giving the best possible hospital care to all who need it with resources which are often limited, the words of Charles Steinmetz are well understood -

"Co-operation is not a sentiment - it is an economic necessity".

I am pleased to record the helpfulness of the North Canterbury Hospital Board not only in assisting with the survey but also in implementing many of the recommendations.

H. B. Turbott.

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P R E F A C E

This report is one of a series of administrative papers written by the Research and Planning Unit (formerly called the Operational Research unit) to make recommendations to the North Canterbury Hospital Board and the Department of Health on the provision and organisation of hospital accommodation on the basis of survey data.

It will be well understood by workers in operational research in hospitals that we are indebted to the work of others - the Nuffield Provincial Hospitals Trust, the Operations Research Division of The Johns Hopkins Hospital and the Oxford Regional Hospital Board to name only three. The recording of dependency by day of operation follows work done at Oxford by Jeffery and Barr (unpublished).

We would thank for their co-operation and assistance during the survey, the nurses in charge of wards of Christchurch, Princess Margaret and Burwood Hospitals who daily recorded the patient data and assessed the dependencies; other members of the nursing staffs of the hospitals especially Mrs M.E.F. Chambers, Matron-in-Chief, and Miss J. Taylor and Miss S.C.I. Rolls, Matrons of Princess Margaret and Burwood Hospitals; Dr T. Morton, Medical Superintendent-in-Chief and Dr C. Dick and Dr J. H. McIntyre, Medical Superintendents of Princess Margaret and Burwood Hospitals; Mr J. G. Laurenson, Secretary to the Board and his staff.

The reports were written in consultation with Dr L. M. Berry, Medical Superintendent-in-Chief, Dr C. G. Riley, Director of Medicine and Mr H. E. H. Denham, Director of Surgery and the report on Paediatrics was written in consultation also with Dr F. T. Shannon, Paediatrician to the Board.

Acknowledgment is made of the help received from Dr R. M. Williams, Director, Applied Mathematics Laboratory and his staff especially with statistical analysis and computer programming and Mr J. P. M. Cornwall, Senior O & M Officer, State Services Commission in the preparation of Reports Nos. 12, 13 and 14.

The Operational Research Unit personnel during the survey were:

Dr I. J. Jeffery,	Physician - Director
Miss Shirley M. Lowe,	Nurse Member
Mr L. V. Chaplin,	Work Study Member
Mr D. Blakeley,	Survey Liaison Officer
Mr C. Gardiner,	Medical Statistician.

It is pleasant to recall the courtesy and co-operation given by the North Canterbury Hospital Board and the staff. The survey was possible only because of this willing assistance and the credit for any worthwhile results which are achieved is due in no small measure to the Board.

PART 10 : ORTHOPAEDIC SURGERY

10.1 INTRODUCTION

This Part of the report concerns patients who were 13 years of age or over and who were admitted under a consultant orthopaedic surgeon. Unless another meaning is given to it, the expression "Sample" in this Part refers only to these patients.

Data for children up to 13 years of age are analysed in Part 6, "Paediatrics" (Special Report Series No.15) and data for patients who were 65 years of age or over are analysed also in Part 5, "Geriatrics" (Special Report Series No.14).

This Part should be read in conjunction with Parts 1, 2 and 3 which refer generally to the Survey in Christchurch (Special Report Series No.12).

10.2 THE SAMPLE

The Sample is a one-in-three random sample and consists of 136 patients who were in Christchurch, or Burwood Hospitals at the start of the survey or admitted during it. None of the sample was admitted to Princess Margaret Hospital.

The numbers of patients in hospital at the start of the survey, admitted during the survey, and in hospital at the end of it are given by hospital and type of admission in Table 1 and by hospital and ward in Table 2.

The survey covered 88 days for Christchurch Hospital and 91 days for Burwood Hospital.

10.21 OBSERVATIONS

- (1) The patients were 136 of the 1,565 patients in the complete survey sample.
- (2) Christchurch and Burwood Hospitals treated 114 and 22 patients respectively of the sample of 136.
- (3) Patients were observed in 4 wards of Christchurch Hospital and 2 wards of Burwood.

10.22 COMMENTS

- (1) The patients were 8.7% of all patients in the complete survey sample.
- (2) Christchurch treated 83.8% of the sample and Burwood 16.2%.
- (3) The admission rate of the sample during the survey was 276 patients in 88 days for Christchurch and is equivalent to 1,145 patients annually (three times the one-in-three sample). The corresponding rates for Burwood are 33 patients in 91 days and 132 patients annually.
- (4) The corresponding admission rate for the two hospitals taken together is 1,277 annually.

10.3 THE PATIENTS

This section analyses data associated with admission and discharge. Where available, the diagnosis on discharge is used. Otherwise, the provisional diagnosis is taken.

10.31 SEX AND AGE-GROUP

The following age-groups are used:-

- (a) 13 - 64 years.
- (b) 65 years and over.

The patients are given by sex and age-group for each hospital in Table 3.

10.32 TYPE OF ADMISSION

The numbers of emergency and waiting-list admissions are given by hospital in Table 4 which also gives the number of patients having surgery.

10.33 REASON FOR ADMISSION

The reasons for admission were recorded as:-

- (a) therapy
- (b) for investigation
- (c) infectious
- (d) other.

In the survey "(c) infectious" was used only for patients who were admitted because of an infectious condition.

The number in each group is given by hospital in Table 5.

10.34 PATIENTS HAVING SURGERY

The number of patients having surgery is given for emergency and waiting-list admissions by hospital in Table 4. "Surgery" is defined in Part 2 (Special Report Series No. 12)

10.35 DISEASE-GROUP

The number of patients in each of the more commonly occurring disease-groups is given by hospital for emergency and waiting-list admissions in Table 6.

10.36 OBSERVATIONS

- (1) There were 72 males and 64 females in the sample.
- (2) 93 patients were aged 13 to 64 years and 43 were aged 65 years or over.
- (3) Of the 136 admissions, 69 were emergency admissions and 67 were waiting-list.
- (4) Of the 67 waiting-list admissions 37 were male and 30 were female; 51 were aged 13 to 64 years and 16 were aged 65 years or over.
- (5) 134 patients were admitted for therapy, 1 for investigation, none as infectious and 1 for other.
- (6) 92 of the 136 were admitted from home and 69 of the 88 discharges were discharged there; 23 were admitted from and 13 were discharged to another public hospital. Of the 23 admissions Christchurch admitted 4 and Burwood 19; all of the 13 discharges were from Christchurch. 18 of the 20 waiting-list patients admitted to Burwood were from another public hospital.
- (7) No one was admitted from a private hospital but 2 were discharged to one.
- (8) Four were admitted from and 2 were discharged to an old peoples home.
- (9) There were 8 deaths and 88 discharges in the sample during the survey period.
- (10) Of the 88 discharges, 19 were referred to their own doctor and 60 were referred to "other" which included out-patient clinics. Seven were referred to a medical social worker and 1 to a district nurse. One was not given.
- (11) The discharges of 9 patients were delayed for social reasons and 1 for an administrative reason.
- (12) Commonly occurring disease-groups were:-
 - (i) Fracture of neck of femur (Code 820) with 21 patients.
 - (ii) Fracture of other and unspecified parts of femur (Code 821) with 15 patients.
 - (iii) Fracture of tibia and fibula (Code 823) with 11 patients.
 - (iv) Other diseases of bone (Code 733) with 9 patients.
 - (v) Fracture of ankle (Code 824) with 8 patients.
- (13) 96 patients had surgery: 45 of them were emergency admissions and 51 waiting-list.

10.37 COMMENTS

- (1) 52.9% of the patients were male and 47.1% female.
- (2) 68.4% were aged 13 to 64 years and 31.6% were aged 65 years or over.
- (3) 50.7% of the admissions were emergency and 49.3% waiting-list.
- (4) Of the waiting-list admissions 55.2% were male and 23.9% were 65 years of age or over.
- (5) Nearly all of the patients were admitted for therapy (134 out of 136) and none of the sample was admitted as "infectious".
- (6) 67.6% of the admissions were from their own homes and 78.4% of the discharges were discharged there.
- (7) Burwood admitted the bulk of the admissions from other public hospitals (19 out of 23) but did not discharge any patient to another public hospital. Of the 13 so discharged from Christchurch 9 were 65 years of age or over and 5 of the 9 had the diagnosis "fracture of neck of femur (Code 820)".
- (8) Few discharges were made to either a private hospital or an old peoples home (2 each out of 88).
- (9) 9.1% of the discharges were referred to either a medical social worker or a district nurse and 10.2% of the discharges were delayed for social reasons.
- (10) Two diseases both involving fractures of the femur (Code 820 and 821) accounted for 36 patients or 26.4% of the patients surveyed.
- (11) 70.6% of the patients had surgery. Of these 46.9% were emergency and 53.1% waiting-list admissions.

10.4 THE LOAD OF PATIENT DAYS

This section deals with the number of days spent in hospital during the survey period by the patients in the sample. The analysis of patient days by dependency is discussed in Sections 10.6 and 10.7.

10.41 HOSPITAL AND WARD

The number of patient days is given by hospital and ward in Table 7.

10.42 SEX AND AGE-GROUP

Patient days are given by sex, age-group and hospital in Table 8.

10.43 TYPE OF ADMISSION

Patient days are given for emergency and waiting-list admissions by hospital in Table 9 which also gives the number of patient days for patients having surgery.

10.44 REASON FOR ADMISSION

Patient days are given by reason for admission and hospital in Table 10.

10.45 PATIENTS HAVING SURGERY

Patient days for the patients in the sample who had surgery are given by type of admission and hospital in Table 9. "Surgery" is defined in Part 2 (Special Report Series No. 12).

10.46 DISEASE-GROUP

Patient days for the more frequently occurring disease-groups are given by type of admission and hospital in Table 11.

10.47 OBSERVATIONS

- (1) The patients accounted for 3,099 patient days of the 22,875 recorded during the survey period for all patients in the survey.

- (2) Of the 3,099, 2,085 were spent in Christchurch and 1,014 in Burwood.
- (3) Wards in which the patients were treated were notably:-
 - (a) At Christchurch
 - (i) Ward 3 with 966 patient days.
 - (ii) Ward 1 with 924 patient days.
 - (b) At Burwood
 - (i) Ward 9 with 1,000 patient days.
- (4) Males accounted for 1,363 patient days and females for 1,736.
 Males accounted for 1,093 patient days of the 2,085 at Christchurch and for 270 of the 1,014 at Burwood.
- (5) Patients aged 13 to 64 years accounted for 1,781 patient days and those 65 years of age or over for 1,318.
 Patients aged 13 to 64 years accounted for 1,546 of the 2,085 at Christchurch and for 235 of the 1,014 at Burwood.
- (6) Emergency admissions accounted for 1,336 patient days of which 1,315 were at Christchurch.
 Waiting-list admissions accounted for 1,763 of which 993 were at Burwood.
- (7) Patients admitted for therapy accounted for 3,025 patient days: 2,011 of the 2,085 patient days at Christchurch and all of the 1,014 at Burwood.
- (8) Patients having surgery accounted for 1,052 patient days: 1,422 of the 2,085 patient days at Christchurch and 248 of the 1,014 at Burwood.
- (9) Disease-groups which predominated in accounting for patient days were:-
 - (i) Fracture of other and unspecified parts of femur (Code 821) with 553.
 - (ii) Fracture of neck of femur (Code 820) with 517.
 - (iii) Fracture of tibia and fibula (Code 823) with 398.
 - (iv) Other diseases of bone (Code 733) with 295.
 - (v) Displacement of intervertebral disc (Code 735) with 172.

10.48 COMMENTS

- (1) The patients accounted for 13.5% of the patient days spent by all patients in the survey sample in the three hospitals.
- (2) Christchurch Hospital took 67.3% of the load of patient days and Burwood 32.7%.
- (3) The load at Christchurch was equivalent to 6,255 patient days in 88 days (three times the one-in-three sample). This corresponds to 71.1 beds at 100% occupancy, 79.0 beds at 90% and 83.6 beds at 85%.
- (4) The corresponding beds at Burwood are 33.4, 37.1 and 39.3.
- (5) The number of equivalent beds for the two hospitals taken together is 104.5 at 100% occupancy, 116.1 at 90% occupancy and 122.9 at 85% occupancy. (Table 23).
- (6) Two wards at Christchurch (1 and 3) supplied 1,890 of the 2,085 patient days or 90.6% and one ward at Burwood supplied 1,000 of 1,014 or 98.6%. These three wards together supplied 2,890 of the 3,099 patient days or 93.3% of the total load.
 The two wards at Christchurch were equivalent to 64.4 beds at 100%, 71.6 at 90% and 75.8 at 85% occupancy.
- (7) Males accounted for 52.4% of the beds at Christchurch, 26.6% at Burwood and 44% overall.
- (8) The 13 to 64 age-group accounted for 74.1% of the beds at Christchurch and 23.2% of the beds at Burwood.

Patients 65 years of age or over occupied 42.5% of the beds overall.

- (9) Waiting-list admissions accounted for 26.3 equivalent beds at Christchurch and 32.7 at Burwood. In all waiting-list admissions accounted for 59 beds at 100%, 65.6 beds at 90% and 69.4 beds at 85% occupancy.
- (10) Fracture of the femur (Codes 820 and 821) accounted for 1,070 patient days or 34.5% of the total.

The 5 diseases of Section 10.47 (8) accounted for 1,854 patient days or 59.8% of the total.

- (11) Patients having surgery at the hospital of admission accounted for 68.2% of the Christchurch patient days, 24.5% of those at Burwood and 53.9% of the total.

10.5 LENGTH OF STAY

This section deals with the overall length of stay recorded for patients in the sample who were discharged or who died during the survey period, or who were still in hospital at the end of the survey.

10.51 DISCHARGES AND DEATHS

During the survey period there were 88 discharges and 8 deaths.

These are given by hospital in Table 2 and the distributions of overall lengths of stay are given separately for discharges and deaths in the two age-groups 13 to 64 years and 65 years or over, in Table 12 and illustrated in Figure 1.

10.52 PATIENTS STILL IN HOSPITAL

The 40 patients who were still in hospital at the end of the survey are given by hospital in Table 2 and the distributions of the numbers of days spent in hospital by them when the survey was completed are given separately for the two age-groups 13 to 64 years and 65 years or over in Table 13.

10.53 OBSERVATIONS

- (1) The 96 patients who were discharged or who died during the survey period spent 4,556 days in hospital. The average length of stay was 47.5 days.

The range was 1 to 1,605 days.

The mode was 4 or 6 days with 8 patients.

Of the 96 patients, 85 were treated in Christchurch and 11 in Burwood. 70 were aged 13 to 64 years and 26 were aged 65 years or over.

65 had a length of stay of 30 days or under, 23 stayed from 31 to 90 days and 8 stayed over 90 days.

- (2) The 88 discharges spent 2,571 days in hospital.

The average length of stay was 29.2 days.

The range was 1 to 231 days.

The mode was 4 or 6 days with 8 patients.

Of the 88 patients, 79 were treated in Christchurch and 9 in Burwood. 67 were aged 13 to 64 years and 21 were aged 65 years or over.

39 stayed 30 days or under, 23, 31 to 90 days and 5 over 90 days.

- (3) The 8 patients who died spent 1,985 days in hospital.

The average length of stay was 248.1 days.

The range was 7 to 1,605 days.

The mode was 7 days with 2 patients.

Of the 8 patients, 6 were treated in Christchurch and 2 in Burwood.

3 were aged 13 to 64 years and 5 were aged 65 years or over.

5 stayed 30 days or under and 3 over 90 days.

- (4) The 40 patients who were still in hospital at the end of the survey had then spent 3,505 days in hospital.

The average time in hospital was 87.6 days.

The range was 1 to 732 days.

Of the 40 patients, 29 were in Christchurch and 11 were in Burwood. 23 were aged 13 to 64 years and 17 were aged 65 years or over.

22 had been in hospital 30 days or under, 11, 31 to 90 days and 7 over 90 days.

10.54 COMMENTS

- (1) 88.5% of the discharges and deaths were recorded in Christchurch and 11.5% in Burwood.

67.7% of them had a length of stay not greater than 30 days, 24% stayed 31 to 90 days and 8.3% stayed over 90 days.

- (2) 89.8% of the discharges were recorded in Christchurch, and 10.2% in Burwood.

68.2% of these had a length of stay not greater than 30 days, 26.1% stayed 31 to 90 days and 5.7% stayed over 90 days.

- (3) 75% of the small number of deaths were recorded in Christchurch and 25% in Burwood.

62.5% of these had a length of stay not greater than 30 days, and 37.5% stayed over 90 days.

- (4) Of the patients still in hospital 72.5% were in Christchurch and 27.5% in Burwood.

- (5) 8 of the discharges and deaths and 7 of the patients still in hospital stayed more than 90 days.

8 of the 15 were in Christchurch, and 7 in Burwood.

- (6) The 10 long-stay patients, (i.e. patients with a length of stay of over 90 days), who were aged 65 years or over, have been considered also in the report dealing with geriatrics.

- (7) Further comments involving length of stay are made in Section 10.7.

10.6 PATIENT DEPENDENCY

This section deals with the daily dependency of the sample. The definitions of the four dependency categories are given in Part 2 (Special Report Series No.12).

10.61 ADMISSION AND DISCHARGE

The dependency on admission for patients in the sample admitted during the survey period is given by type of admission and hospital in Table 14. Similar data for discharges are given in Table 15.

10.62 PRE-OPERATION DEPENDENCY

A frequency distribution of the number of patients, admitted during the survey period, who had an operation on the given recorded day is given by hospital and type of admission in Table 16.

A distribution of the number of such patients who spent a given number of days continuously in Category 1 before surgery is similarly given in Table 17.

10.63 POST-OPERATION DEPENDENCY

A frequency distribution of the number of patients who were discharged during the survey period after a given number of post-operation recorded days is given by hospital and type of admission in Table 18.

A similar distribution of these patients with a given number of days continuously in Category 1 before discharge is given in Table 19 and a similar distribution relating to the number of post-operation days spent in Category 2 before discharge or becoming Category 1 is given in Table 20.

10.64 FRACTURE OF NECK OF FEMUR (CODE 820)

The dependency histories of patients discharged during the survey period with the diagnosis of "fracture of neck of femur (Code 820)" are given in Table 21.

10.65 DAY OF WEEK

Mean values for the number of patients in each dependency category for each day of the week are given in Table 22.

These mean values are the means of three times the one-in-three sample values. Care should be taken, therefore, in comparing the values in this table with those given for the sample only.

10.66 OBSERVATIONS

- (1) Of the 103 patients admitted during the survey, 3 were in Category 4 on admission, 25 were in Category 3, 32 in Category 2 and 43 in Category 1.
- (2) Of the 52 emergency admissions 3 were in Category 4, 24 in Category 3, 22 in Category 2 and 3 in Category 1.
- (3) Of the 88 discharges, 42 were in Category 1, 44 in Category 2 and 2 in Category 3.
- (4) The number of pre-operation recorded days ranged from 0, i.e. surgery within 24 hours of admission, to 3 for emergency patients and from 0 to 2 for waiting-list.

The mode for emergency admissions was 0 days (11 patients out of 23).

The mode for waiting-list admissions was 2 days, i.e. surgery between 48 and 72 hours after admission (19 patients out of 26).

- (5) In the pre-operation period 1 of 23 emergency patients and 24 of 26 waiting-list patients spent 1 or 2 days in Category 1. (Table 17).
- (6) Post-operation recorded days ranged from 1 to 42.
5 of 23 emergency patients and 10 of the 26 waiting-list patients spent 1 day which was the mode. (Table 18).
- (7) The number of post-operation days spent continuously in Category 1 before discharge ranged from 0 to 20 for emergency patients and from 0 to 7 for waiting-list.
15 of 23 emergency patients and 13 of 26 waiting-list patients were discharged without spending any day post-operatively in Category 1.
- (8) The number of post-operation days spent continuously in Category 2 before discharge or becoming Category 1 ranged from 0 to 34 for emergency admissions and from 0 to 35 for waiting-list.
- (9) Patients discharged with the diagnosis of "fracture of neck of femur (Code 820)" had a wide range of post-operation days and showed a frequent transfer to another hospital. Of the 15 patients 2 were admitted from and 6 were discharged to another public hospital and 4 were discharged to a private hospital.
- (10) The equivalent mean daily number of patients at Christchurch was 71.9 and at Burwood 33.3. The equivalent daily mean values ranged at Christchurch from 67.8 to 74.8 and at Burwood from 32.5 to 33.9.

10.67 COMMENTS

- (1) 2.9% of the patients were admitted in the most dependent category Category 4 and 41.7% in the least dependent category Category 1. 5.8% of the emergency admissions were admitted in Category 1.
- (2) 47.7% of the patients discharged were in Category 1, and 50.0% were in Category 2. The 2 patients discharged in Category 3 were discharged to another public hospital.
- (3) Waiting-list patients usually spent 2 days in Category 1 before operation. The point is discussed in Section 10.7.
- (4) 50% of waiting-list patients having surgery spent some period post-operatively in Category 1 and 12 of 13 patients spent 1 day.
- (5) The long post-operation stay often occurring in Orthopaedic patients is illustrated in Table 21 for the most commonly recorded disease "fracture of neck of femur (Code 820)". The organisation of care included a

selective use of hospitals for the immediate operation period and some succeeding days, and for the following convalescent period essentially in Category 2. The point is also discussed in Section 10.7.

- (6) This selective use of hospitals is indicated also by the daily dependency patterns of Table 22 where the general absence of Category 4 patients at Burwood and the stability of the equivalent mean daily values indicate the convalescent role of the hospital and may be compared with similar values for Christchurch.
- (7) Further discussion relating to dependency is made in Section 10.7.

10.7 DISCUSSION

This section deals with subjects which are more appropriately grouped together following the previous sections.

10.71 PERCENTAGE OCCUPANCY

The number of beds occupied by patients admitted under the care of a consultant surgeon is variable and an accurate percentage occupancy by hospital is not ascertainable. In general an 85% occupancy is assumed but values which are influenced by percentage occupancy, e.g. equivalent beds are generally discussed for 90% and 85% occupancies. Corresponding magnitudes for another value of the percentage occupancy are of course readily able to be obtained

10.72 EQUIVALENT BEDS

As mentioned in Section 10.48 (5) the number of equivalent beds in use during the survey for orthopaedic patients was 104.5 at 100% occupancy 116.1 at 90% occupancy and 122.9 at 85%.

The 122.9 at 85% occupancy are given for short-stay and long-stay patients by hospital and age-group in Table 25 and by type of bed in Tables 26 and 27.

10.73 BED TURNOVER

If an 85% occupancy is assumed the 83.6 beds at Christchurch served 255 patients who were discharged or who died during the survey period (three times the one-in-three sample). The equivalent annual rate for discharges and deaths is 1,058 and the bed turnover 12.7 patients per bed per year.

Corresponding values for Burwood are an annual rate of 132 discharges and deaths and a bed turnover of 3.4 patients per bed per year.

The two hospitals taken together had an equivalent bed turnover of 9.6 patients per bed per year.

33 waiting-list patients discharged from Christchurch were served by an equivalent 10.3 beds at 85% occupancy. This represents a turnover of 13.3 patients per bed per year.

10.74 THE WAITING-LIST

At the start of the survey in June 1962 there were 910 names on the waiting-list. The number rose to 1,015 in October 1962 fell to 947 in January 1963, was 696 in August 1963 and 728 at November 1963.

The decrease was due to a culling of the list. If the rate of increase in the list observed over the period August 1963 to November 1963 is accepted as representative and the small number of children on the list is ignored (there were 24 children under 13 years of age on the waiting-list at October 1962 and 16 at January 1963) the position can be stated as follows:-

- (a) The waiting-list may be assumed to increase by 128 names annually.
- (b) The annual rate observed during the survey for discharges of waiting-list patients from Christchurch Hospital was 411.
- (c) In a year 539 persons were recommended for admission (411 plus 128).
- (d) By March 1964 there would be say 770 names on the list and if admissions were arranged more or less in rotation a patient could wait almost 2 years for admission.
- (e) At a bed turnover of 13.3 patients per bed year (Section 10.73) 57.9 bed years at 85% occupancy are required to clear the list of 770 persons. This means that the list could be cleared by making available say a further 58 beds for one year or 29 beds for 2 years and so on assuming that other services were available.

The growth in the waiting-list could be checked by providing an additional 9.6 beds at 85% occupancy assuming that the conditions operating during the survey continued to apply.

The number of beds required is further discussed in Section 10.76.

10.75 THE PATTERN OF CARE

In specialities such as orthopaedic surgery where the incidence of patients having surgery is high, it is useful to consider the in-patient stay of a patient having surgery in three periods, viz. a pre-operation period in which the patient is often in a less dependent state, a period of high or full dependency after surgery and a period of recovery with diminishing dependency. This follows a model which is being developed along the lines of Jeffery and Barr at Oxford (unpublished).

During this third period, patients occupy beds in an acute hospital although in general they are much less dependent upon the nursing staff and the expensive services there. The possibility of discharging some of them at this stage should be considered, therefore, and if discharge is not desirable, the possibility of transferring them to "convalescent" beds in a less expensive establishment should be examined. By "convalescent care" is meant that kind of care which is variously described as "intermediate care" or "pre-convalescent care" rather than "self care". Data from the survey support both propositions on the grounds that:-

- (a) In Category 1 and often in Category 2, the patient is receiving little in the way of nursing care and
- (b) The risk of regression is slight.

On the first point, the definitions of dependency categories are given in Part 2 of the full report (Special Report Series No. 12) but the characteristics of Category 1 and Category 2 are as follows:-

In Category 1 the patient generally is independent for walking, feeding, bathing and eliminating, is not receiving any item of special nursing care and is up for at least 4 hours a day.

In Category 2 the patient is partly dependent, is receiving some item of nursing care and may be up for part of the day. He is not generally receiving any of the special services associated with an acute hospital, however, and may be discharged in this category.

A review of each patient's history in the survey confirms that generally, patients in Category 1 or 2 received little nursing care of the kind associated with an acute bed.

On the second point - the danger of regression - there were 5 cases of regression in the post-operation period among the patients who were discharged during the survey period.

The details of the regressions in the categories are:-

- (a) From 1, 2 or 3 to 4 - Nil
- (b) From 1 to 3 - Nil
- (c) From 1 to 2 - 3 patients
- (d) From 2 to 3 - 2 patients.

On these data for the post-operation period there is little danger of regression to Category 4 or from Category 1 to Category 3. There is a 1 in 16 chance of regression from Category 1 to Category 2 and a 1 in 25 chance of regression from Category 2 to Category 3.

The need for a consultant to regard each patient individually to be transferred or discharged only on that patient's requirements for nursing care is fully supported. Epidemiologically, however, there is a strong case for proposing that the average length of stay for the patients under discussion could be decreased without hurt to the patients. The proposal is developed in Section 10.76.

As mentioned in Section 10.67(5) in referring to the dependency histories of patients with the diagnosis of "fracture of neck of femur" there is evidence of a selective use being made of hospitals in the survey. Presumably this organisation exists to make the most effective use of the orthopaedic wards particularly at Christchurch Hospital by using them as admitting and acute wards.

10.76 BEDS REQUIRED

In assessing the number of beds required a difficulty lies in deciding when a patient is convalescent or ready for discharge. Nevertheless, dependency categories such as those used in the survey seem to provide a useful guide on the point. The survey recorded the daily needs of the patients as well as their daily dependencies. A review of the data supports that, having regard to what is meant by "convalescent" in this context, (see Section 10.75) epidemiologically patients may be regarded as "convalescent" after spending four days in Category 2 in the course of a progressive recovery. Also it is unusual for some clinical indication to be recorded for not discharging patients after one day in Category 1 during this progressive recovery.

It is hoped to assess these landmarks in the hospital stay more accurately by further study. In the recorded data there was an apparent tendency to overstate the number of days spent post-operatively in Category 1 and although overt cases have been corrected the final number of such days could still be overstated.

It is emphasised that a patient may properly be in hospital in Category 1 and in the case of patients in the post-operation period particularly, there are reasons other than those recorded in the survey for the continued stay of patients in low dependency states. Nevertheless the components of the patients stay in hospital are such as to raise the question as to the necessity for the time spent in the pre-operation period in Category 1 and in the post-operation period in Category 1.

The relative magnitudes of the five periods in the hospital stay given in Table 24 illustrate the point. All patient days for the sample are included in the table. The following arrangement of days has been used:-

- (a) All patient days for patients dying in the survey period have been regarded as "acute".
- (b) Patient days for patients having an operation have been allocated in the relevant periods. The fourth day in Category 2 refers to the sequence of days in Category 2 after which there was no regression of dependency.
- (c) Patients not having an operation have been treated similarly to patients in (b). The division into pre- and post-operation periods does not, of course apply to these patients.
- (d) Patients in hospital at the end of the survey have been assumed not to experience regression thereafter (see Section 10.75).

The following observations and comments are made:-

- (a) The patient days immediately following admission spent continuously in periods in excess of one day in Category 1 were 1% of all patient days.
- (b) The more dependent or "acute" periods of stay occupied 39% of the total.
- (c) The remaining 60% of the total days were "convalescent" in type and 7.2% of the total time was spent in periods in Category 1 in excess of one day in the course of a progressive recovery before discharge or in the course of an apparent progressive recovery in the case of patients still in hospital.

On the face of it 8.2% (7.2% plus 1%) of the total time appears available at the two ends of the patients stay for shortening the stay and consequently reducing the waiting-list time for admission. To compensate for the observed tendency to over-record the number of days in Category 1 mentioned earlier, the number of days spent before discharge in Category 1 in excess of two might be considered, in which case the 8.2% is reduced to 7.0% and it is recommended that a reduction of this order be attempted.

It is assumed that consultant, nursing and other services could be increased as necessary to make use of the beds which would become available if a reduction in length of stay were achieved. The survey of course, throws no light on whether these services could be augmented in this way.

A decision to transfer or discharge a patient in light of the dependency history rests upon a knowledge of the patients daily progress through the categories. A record of the appropriate dependency category and the items of nursing care given to the patient each day would materially assist those making such a decision. The use of a suitable record is recommended.

Orthopaedic surgery is a speciality in which there is a relatively large percentage of long-stay patients, i.e. patients whose length of stay is 90 days or over. Some of these long-stay patients may be accommodated in geriatric wards and Table 27 gives the number of equivalent beds at 85% occupancy used by long-stay patients in two age-groups in the sample in terms of the five dependency periods used in Table 24.

During the survey orthopaedic patients aged 65 years or over occupied 16 equivalent long-stay beds at 90% occupancy and those aged 13 to 64 years, 11.3 equivalent beds. Some 17 of the long-stay beds were convalescent in type.

10.77 PREDICTION OF DEMAND

Many factors enter into the prediction of the number of orthopaedic beds which will be required in public hospitals in Christchurch. Nevertheless the survey provides a basis for assessing the number of beds needed if it is assumed that:-

- (a) Private hospitals maintain the present proportion of orthopaedic work.
- (b) Consultant, nursing and other services are expanded to match the availability of beds.

- (c) There will be no significant change in the age and sex distributions of persons over 12 years of age in the predicted populations or in the incidence and treatment of patients admitted to a public hospital under a consultant orthopaedic surgeon.

The hospitals surveyed may be considered to have served a population of 274,000 during the survey period. The orthopaedic load as then organised could be met by 122.9 beds at 85% occupancy with a further 9.6 beds at 85% occupancy to meet the growth in the waiting-list, i.e. 132.5 beds or 48.4 beds per 100,000 population.

Using this rate with the Ministry of Works population predictions for the years below and maintaining the ratio of acute to convalescent beds given in Table 24 future needs would be approximately:-

YEAR	POPULATION (Thousands)	BEDS REQUIRED		
		ACUTE	CONVALESCENT	ALL
1966	300.7	57	89	146
1971	337.2	64	99	163
1981	419.7	79	124	203

If the ratio of long-stay beds to all beds is assumed constant the expected numbers of long-stay beds at 85% occupancy as organised during the survey are 12.5 beds per 100,000 and using the ratio of acute to convalescent beds given in Table 27 are approximately:-

YEAR	POPULATION (Thousands)	LONG-STAY BEDS REQUIRED		
		ACUTE	CONVALESCENT	ALL
1966	300.7	14	24	38
1971	337.2	16	26	42
1981	419.7	20	33	53

If the 7% reduction were achieved the rate of 48.3 beds per 100,000 would become 44.9 beds per 100,000 and using this latter rate the predicted beds are:-

YEAR	POPULATION (Thousands)	BEDS REQUIRED		
		ACUTE	CONVALESCENT	ALL
1966	300.7	57	79	136
1971	337.2	64	88	152
1981	419.7	79	110	189

It is recommended that the Board plan for the number of beds needed in 1981 and that 79 acute beds and 110 convalescent beds be accepted as this requirement. The convalescent beds can be considered as part of the total required by patients in a number of specialities.

10.8 CONCLUSION AND RECOMMENDATIONS

This report attempts to assess the dependency of patients admitted to hospital under a consultant orthopaedic surgeon upon the ward nursing staff and upon some ward services. As in the reports dealing with other specialities there is seen the difficulty in deciding when a patient should leave hospital. It is stressed that this decision is one properly to be made by the medical practitioner responsible for the patients care. This study which is an epidemiological one, however, contains data which can assist in this and other decisions. In line with the comments and discussion in the report it is recommended that the Board -

- (1) admit waiting-list patients generally one day before operation;
- (2) discharge sooner patients in the lowest dependency state;
- (3) use convalescent accommodation for patients no longer in need of acute accommodation;

- (4) introduce a system of recording progressively a patients state of dependency to assist consultants in discharging or transferring patients;
- (5) provide some 79 acute beds and 110 convalescent beds in public hospitals in Christchurch to serve patients admitted under consultant orthopaedic surgeons until 1981;
- (6) use the survey data to assist in planning and designing the wards including the long-stay accommodation.

TABLE 1 PATIENTS IN HOSPITAL AT THE START OF THE SURVEY, ADMITTED DURING THE SURVEY AND IN HOSPITAL AT THE END OF THE SURVEY BY HOSPITAL AND TYPE OF ADMISSION

HOSPITAL	NUMBER OF PATIENTS											
	AT START OF SURVEY			ADMITTED DURING SURVEY			AT END OF SURVEY			ALL		
	E.	W.L.	ALL	E.	W.L.	ALL	E.	W.L.	ALL	E.	W.L.	ALL
Christchurch	15	7	22	52	40	92	15	14	29	67	47	114
Burwood	2	9	11	-	11	11	-	11	11	2	20	22
BOTH	17	16	33	52	51	103	15	25	40	69	67	136

TABLE 2 PATIENTS IN HOSPITAL AT START OF SURVEY, ADMITTED, DISCHARGED AND DYING DURING THE SURVEY AND IN HOSPITAL AT THE END OF THE SURVEY BY HOSPITAL AND WARD

HOSPITAL AND WARD*		NUMBER OF PATIENTS					
		AT START	ADMITTED	DISCHARGED	DIED	STILL IN	ALL
Christchurch	1	22	51	43	3	15	61
	3	11	36	32	3	12	47
	4	-	1	1	-	-	1
	12A	1	4	3	-	2	5
	ALL	22	92	79	6	29	114
Burwood	2	1	-	-	1	-	1
	7	10	11	9	1	11	21
	ALL	11	11	9	2	11	22
BOTH	ALL	33	103	88	8	40	136

* Ward of discharge

TABLE 3 PATIENTS BY SEX, AGE-GROUP AND HOSPITAL

AGE-GROUP (YEARS)	HOSPITAL								
	CHRISTCHURCH			BURWOOD			BOTH		
	M.	F.	ALL	M.	F.	ALL	M.	F.	ALL
13 - 64	57	30	87	4	2	6	61	32	93
65 and over	8	19	27	3	13	16	11	32	43
ALL	65	49	114	7	15	22	72	64	136

TABLE 4 PATIENTS BY TYPE OF ADMISSION, HAVING SURGERY AND HOSPITAL

HOSPITAL	HAVING SURGERY	TYPE OF ADMISSION		
		EMERGENCY	WAITING-LIST	ALL
Christchurch	YES	36	31	67
	NO	31	16	47
	All	67	47	114
Burwood	YES	-	6	6
	NO	2	14	16
	All	2	20	22
BOTH	YES	36	37	73
	NO	33	30	63
	ALL	69	67	136

TABLE 5 PATIENTS BY REASON FOR ADMISSION AND HOSPITAL

HOSPITAL	REASON FOR ADMISSION				
	THERAPY	INVESTIGATION	INFECTIOUS	OTHER	ALL
Christchurch	112	1	-	1	114
Burwood	22	-	-	-	22
BOTH	134	1	-	1	136

TABLE 6 PATIENTS BY DISEASE-GROUP, HOSPITAL AND TYPE OF ADMISSION

DISEASE-GROUP		HOSPITAL									
CODE NOS.	DESCRIPTION	CHRISTCHURCH			BURWOOD			BOTH			
		E.	W.L.	ALL	E.	W.L.	ALL	E.	W.L.	ALL NO. %	
820	Fracture of neck of femur	16	1	17	1	3	4	17	4	21	15.4
821	Fracture of other and unspecified parts of femur	9	-	9	-	6	6	9	6	15	11.0
823	Fracture of tibia and fibula	7	1	8	-	3	3	7	4	11	8.1
733	Other diseases of bone	1	7	8	-	1	1	1	8	9	6.6
824	Fracture of ankle	5	2	7	-	1	1	5	3	8	5.9
723	Osteo-arthritis (arthrosis) and allied conditions	-	5	5	-	-	-	-	5	5	3.7
735	Displacement of intervertebral disc	1	4	5	-	-	-	1	4	5	3.7
734	Internal derangement of knee joint	-	3	3	-	1	1	-	4	4	2.9
738	Other diseases of joint	-	4	4	-	-	-	-	4	4	2.9
741	Synovitis, bursitis, and tenosynovitis without mention of occupational origin	-	4	4	-	-	-	-	4	4	2.9
Remainder		28	16	44	1	5	6	29	21	50	36.9
ALL	ALL	67	47	114	2	20	22	69	67	136	100

TABLE 7 PATIENT DAYS BY HOSPITAL AND WARD, NUMBER AND PERCENTAGE

HOSPITAL	WARD	HOSPITAL	
		NUMBER	PERCENTAGE
Christchurch	1	924	29.8
	3	966	31.2
	4	22	0.7
	12A	173	5.6
	All	2,085	67.3
Burwood	2	14	0.4
	7	1,000	32.3
	All	1,014	32.7
BOTH	ALL	3,099	100

TABLE 8 PATIENT DAYS BY SEX, AGE-GROUP AND HOSPITAL

AGE-GROUP (YEARS)	HOSPITAL								
	CHRISTCHURCH			BURWOOD			ALL		
	M.	F.	ALL	M.	F.	ALL	M.	F.	ALL
13 - 64	931	615	1,546	133	102	235	1,064	717	1,781
65 and over	162	377	539	137	642	779	299	1,019	1,318
ALL	1,093	992	2,085	270	744	1,014	1,363	1,736	3,099

TABLE 9 PATIENT DAYS BY TYPE OF ADMISSION HAVING SURGERY AND HOSPITAL

HOSPITAL	HAVING SURGERY	TYPE OF ADMISSION		
		EMERGENCY	WAITING-LIST	ALL
Christchurch	YES	770	652	1,422
	NO	545	118	663
	All	1,315	770	2,085
Burwood	YES	-	248	248
	NO	21	745	766
	All	21	993	1,014
BOTH	YES	770	900	1,670
	NO	566	863	1,429
	ALL	1,336	1,763	3,099

TABLE 10 PATIENT DAYS BY REASON FOR ADMISSION AND HOSPITAL

HOSPITAL	REASON FOR ADMISSION				
	THERAPY	INVESTIGATION	INFECTIOUS	OTHER	ALL
Christchurch	2,011	67	-	7	2,085
Burwood	1,014	-	-	-	1,014
ALL	3,025	67	-	7	3,099

TABLE II PATIENT DAYS BY DISEASE-GROUP, HOSPITAL AND TYPE OF ADMISSION

DISEASE-GROUP		HOSPITAL									
CODE NOS.	DESCRIPTION	CHRISTCHURCH			BURWOOD			BOTH			
		E.	W.L.	ALL	E.	W.L.	ALL	E.	W.L.	ALL	
821	Fracture of other and unspecified parts of femur	157	-	157	-	396	396	157	396	553	17.8
820	Fracture of neck of femur	370	6	376	14	127	141	384	133	517	16.7
823	Fracture of tibia and fibula	223	6	229	-	169	169	223	175	398	12.8
733	Other diseases of bone	37	221	258	-	37	37	37	258	295	9.5
735	Displacement of intervertebral disc	23	149	172	-	-	-	23	149	172	5.6
824	Fracture of ankle	50	7	57	-	56	56	50	63	113	3.7
812	Fracture of humerus	17	-	17	-	49	49	17	49	66	2.1
Remainder		438	381	819	7	159	166	445	540	985	31.8
ALL	ALL	1315	770	2085	21	993	1014	1336	1763	3099	100

TABLE 12 FREQUENCY DISTRIBUTION OF LENGTHS OF STAY FOR DISCHARGES AND FOR DEATHS BY HOSPITAL AND AGE-GROUP

DISCHARGES		AGE-GROUP	NUMBER OF DAYS IN LENGTH OF STAY																												ALL				
HOSPITAL			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28		29	30	>30	
Christchurch	13 - 64	1	4	5	8	2	8	1	-	2	3	1	-	1	2	1	1	-	-	-	2	-	1	2	-	1	1	-	-	-	-	-	1	a 14	62
	65 and over	1	-	-	-	1	-	1	-	1	-	1	-	1	-	1	-	1	1	-	-	-	-	-	1	-	-	-	-	-	-	-	b 7	17	
	ALL	2	4	5	8	3	8	1	1	2	4	1	-	2	2	2	1	-	1	1	2	-	1	2	1	1	1	-	-	1	1	21	79		
Burwood	13 - 64	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	c 3	5	
	65 and over	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	d 4	4		
	ALL	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	7	9		
BOTH	13 - 64	1	4	5	8	2	8	1	-	2	3	2	-	1	2	1	1	-	1	-	2	-	1	2	-	1	1	-	-	-	-	1	17	67	
	65 and over	1	-	-	-	1	-	1	-	1	-	1	-	1	-	1	-	1	1	-	1	-	-	-	1	-	-	-	-	-	-	-	11	21	
	ALL	2	4	5	8	3	8	1	1	2	4	2	-	2	2	2	1	-	2	1	2	-	1	2	1	1	1	-	-	1	1	28	88		

18.

DEATHS			NUMBER OF DAYS IN LENGTH OF STAY																															
HOSPITAL	AGE-GROUP																																	
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	>30	ALL	
Christchurch	13 - 64	-	-	-	-	-	-	-	-	1	-	-	1	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	3
	65 and over	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	e 1	3	
	ALL	-	-	-	-	-	2	-	2	-	1	-	1	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	1	6		
Burwood	13 - 64	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	65 and over	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	f 2	2	
	ALL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2		
BOTH	13 - 64	-	-	-	-	-	-	-	-	1	-	-	1	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	3	
	65 and over	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	5	
	ALL	-	-	-	-	-	2	-	2	-	1	-	1	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	3	8	

a 31, 34, 42, 43, 45, 46, 49, 50, 53, 59, 87, 200, 231
b 37, 38, 54, 59, 120, 134, 139
c 37, 53, 53
d 33, 49, 57, 81
e 161
f 160, 1605

FIGURE 1 FREQUENCY DISTRIBUTION OF LENGTHS OF STAY FOR DISCHARGES AND FOR DEATHS

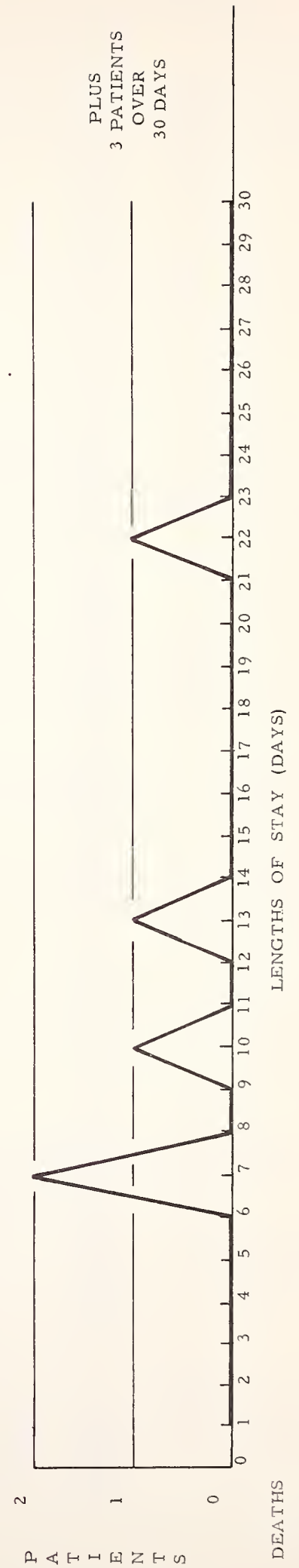
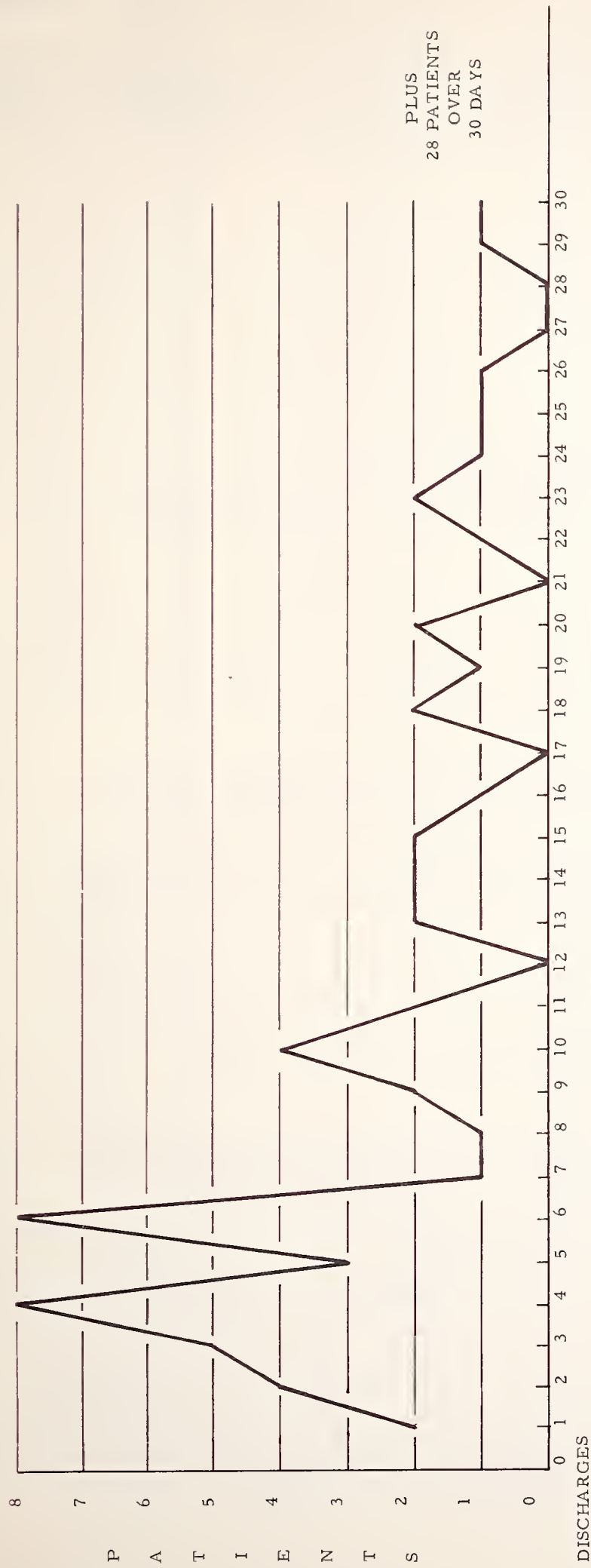


TABLE 13 FREQUENCY DISTRIBUTION OF LENGTHS OF STAY FOR PATIENTS STILL IN HOSPITAL AT END OF SURVEY BY HOSPITAL AND AGE-GROUP

HOSPITAL	AGE-GROUP	NUMBER OF DAYS IN LENGTH OF STAY																												>30	ALL	
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28			29
Christchurch	13 - 64	-	-	-	-	2	1	2	-	-	-	-	1	1	-	-	-	1	-	2	-	2	1	-	1	-	1	-	-	a	7	22
	65 and over	-	-	-	-	1	1	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	b	3	7	
	ALL	-	-	-	-	3	2	2	-	-	-	1	1	1	1	-	-	1	-	2	-	2	1	-	2	-	1	-	-	10	29	
Burwood	13 - 64	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	c	1	1	
	65 and over	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	d	7	10	
	ALL	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	8	11		
BOTH	13 - 64	-	-	-	-	2	1	2	-	-	-	-	-	1	1	-	1	-	1	-	2	-	2	1	-	1	-	1	-	8	23	
	65 and over	1	-	-	-	1	1	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	1	-	1	-	-	10	17		
	ALL	1	-	-	-	3	2	2	-	-	-	-	1	1	1	1	-	1	-	2	-	2	2	-	2	-	1	-	-	18	40	

a 31, 34, 40, 64, 80, 134, 732

c 169

b 36, 40, 41

d 42, 50, 58, 228, 306, 489, 585

TABLE 14 PATIENT DEPENDENCY ON ADMISSION BY TYPE OF ADMISSION AND HOSPITAL

DEPENDENCY CATEGORY	HOSPITAL AND TYPE OF ADMISSION								
	CHRISTCHURCH			BURWOOD			BOTH		
	E.	W.L.	ALL	E.	W.L.	ALL	E.	W.L.	ALL
1	3	38	41	-	2	2	3	40	43
2	22	2	24	-	8	8	22	10	32
3	24	-	24	-	1	1	24	1	25
4	3	-	3	-	-	-	3	-	3
ALL	52	40	92	-	11	11	52	51	103

TABLE 15 PATIENT DEPENDENCY ON DISCHARGE BY TYPE OF ADMISSION AND HOSPITAL

DEPENDENCY CATEGORY	HOSPITAL AND TYPE OF ADMISSION								
	CHRISTCHURCH			BURWOOD			BOTH		
	E.	W.L.	ALL	E.	W.L.	ALL	E.	W.L.	ALL
1	18	17	35	-	7	7	18	24	42
2	26	16	42	-	2	2	26	18	44
3	2	-	2	-	-	-	2	-	2
4	-	-	-	-	-	-	-	-	-
ALL	46	33	79	-	9	9	46	42	88

TABLE 16 NUMBER OF PATIENTS ADMITTED DURING THE SURVEY PERIOD WITH FIRST OR ONLY OPERATION ON THE GIVEN RECORDED DAY BY HOSPITAL AND TYPE OF ADMISSION

HOSPITAL	TYPE OF ADMISSION	RECORDED DAY										TOTAL PATIENTS
		1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th	
Christchurch	Emergency	11	6	4	1	-	-	-	-	-	-	23
	Waiting-list	2	5	19	-	-	-	-	-	-	-	26
	ALL	13	11	23	1	-	-	1	-	-	-	49

NOTE: There were no such patients at Burwood.

TABLE 17 NUMBER OF PATIENTS ADMITTED DURING THE SURVEY PERIOD WITH GIVEN NUMBER OF RECORDED DAYS CONTINUOUSLY IN CATEGORY 1 BEFORE FIRST OR ONLY OPERATION BY HOSPITAL AND TYPE OF ADMISSION

HOSPITAL	TYPE OF ADMISSION	RECORDED DAY							PATIENT DAYS INVOLVED
		0	1st	2nd	3rd	4th	5th	6th	
Christchurch	Emergency	21	-	1	1	-	-	-	5
	Waiting-list	2	5	19	-	-	-	-	43
	ALL	23	5	20	1	-	-	-	48

NOTE: There were no such patients at Burwood

TABLE 18 NUMBER OF PATIENTS DISCHARGED DURING THE SURVEY PERIOD WITH GIVEN NUMBER OF POST-OPERATION RECORDED DAYS BY HOSPITAL AND TYPE OF ADMISSION

HOSPITAL	TYPE OF ADMISSION	POST-OPERATION RECORDED DAYS																												PATIENTS	PATIENT DAYS		
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28			29	30
Christchurch	Emergency	5	2	2	1	1	1	-	-	1	-	-	-	-	1	-	1	-	1	-	2	-	1	-	1	-	1	-	-	1	-	23	275
	Waiting-list	10	1	3	1	-	-	1	-	-	1	1	1	2	-	-	-	-	1	-	1	-	1	-	1	-	-	-	-	-	# 2	26	234
	ALL	15	3	5	2	1	1	1	-	1	1	1	1	1	2	-	1	-	1	1	1	1	2	-	2	-	-	1	-	1	-	4	49

NOTES: * The 2 numbers are 31 and 34
The 2 numbers are 40 and 42.

There were no such patients at Burwood

TABLE 19 NUMBER OF PATIENTS DISCHARGED DURING THE SURVEY PERIOD WITH GIVEN NUMBER OF POST-OPERATION RECORDED DAYS CONTINUOUSLY IN CATEGORY 1 BEFORE DISCHARGE BY HOSPITAL AND TYPE OF ADMISSION

HOSPITAL	TYPE OF ADMISSION	POST-OPERATION RECORDED DAYS																														PATIENT DAYS INVOLVED		
		0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29		30	>30
Christchurch	Emergency	15	5	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	29
	Waiting-list	13	12	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	19	
	ALL	28	17	2	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	48	

NOTE: There were no such patients at Burwood

TABLE 20 NUMBER OF PATIENTS DISCHARGED DURING THE SURVEY PERIOD WITH GIVEN NUMBER OF POST-OPERATION RECORDED DAYS CONTINUOUSLY IN CATEGORY 2 BEFORE DISCHARGE OR BEFORE BEING IN CATEGORY 1 BY HOSPITAL AND TYPE OF ADMISSION

HOSPITAL	TYPE OF ADMISSION	POST-OPERATION RECORDED DAYS																														PATIENT DAYS INVOLVED			
		0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29		30	>30	
Christchurch	Emergency	5	2	2	2	1	1	-	1	-	3	1	-	-	-	-	-	-	-	-	-	-	1	-	1	-	1	-	-	-	-	-	*	1	196
	Waiting-list	7	4	2	2	1	1	-	-	-	1	1	-	1	3	-	-	-	-	-	1	-	-	-	-	-	-	-	-	1	-	-	#	1	173
	ALL	12	6	4	4	2	2	-	1	-	4	2	-	1	3	-	-	-	-	-	-	1	-	1	-	1	-	1	-	1	-	2	-	369	

NOTES: * The number is 34
The number is 35.

There were no such patients at Burwood

TABLE 21 PATIENT DEPENDENCY FOR FRACTURE OF NECK OF FEMUR (CODE 820) BY TYPE OF ADMISSION AND RECORDED DAY

TYPE OF ADMISSION	RECORDED DAY																																								
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	
WAITING-LIST	1	1	OP	2	TO PRIVATE HOSPITAL																																				
EMERGENCY	3	OP	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	TO PRIVATE HOSPITAL															
EMERGENCY	OP	2	2	2	2	2	2	2	2	TO ANOTHER PUBLIC HOSPITAL																															
EMERGENCY	2	OP	3	3	3	3	3	3	3	3	2	2	2	2	2	2	2	2	2																						
EMERGENCY	OP																																								
EMERGENCY	3	3	OP	3	3	3	3	3	2	2	2	2	2	2	2	2	2	2	TO ANOTHER PUBLIC HOSPITAL																						
EMERGENCY	3	OP	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	TO PRIVATE HOSPITAL			
EMERGENCY	2	2	OP	3	TO ANOTHER PUBLIC HOSPITAL (ADMITTED FROM ANOTHER PUBLIC HOSPITAL)																																				
EMERGENCY	3	OP	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	2	2	2	2	2	2	2	TO PRIVATE HOSPITAL																
WAITING-LIST	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	(FROM ANOTHER PUBLIC HOSPITAL)				

The other discharges were 5 emergency admissions who were discharged during the survey period:

- (1) On the 67th recorded day of a stay of 231 days with last 52 days in Category 2 (to another public hospital).
- (2) On the 24th recorded day of a stay of 87 days with 20 post-operation days, 9 in Category 3, 8 in Category 2 and 3 in Category 1.
- (3) On the 16th recorded day of a stay of 120 days with 16 days in Category 3 (to another public hospital).
- (4) On the 2nd recorded day of a stay of 139 days with 2 days in Category 2 (to another public hospital).
- (5) On the 65th recorded day of a stay of 134 days with 65 days in Category 2.

TABLE 22 EQUIVALENT NUMBER OF PATIENTS IN HOSPITAL DURING THE SURVEY PERIOD BY HOSPITAL, DEPENDENCY CATEGORY AND DAY OF WEEK

HOSPITAL	DEPENDENCY CATEGORY		MON	TUES	WED	THURS	FRI	SAT	SUN	ALL
Christchurch	1	Mean Range	7.3 3-15	4.4 0-12	6.0 0-12	4.6 0-12	4.4 0-9	3.0 0-9	7.3 3-12	5.3 0-15
	2	Mean Range	46.0 24-57	50.5 27-63	49.8 27-60	48.5 24-63	47.3 24-60	46.3 24-60	45.3 24-63	47.7 24-63
	3	Mean Range	17.3 6-27	16.5 6-27	18.2 9-27	20.1 6-33	19.2 9-33	18.0 9-33	17.8 6-36	18.2 6-36
	4	Mean Range	.3 0-3	1.3 0-6	.7 0-3	.7 0-3	.5 0-3	.5 0-3	.3 0-3	.6 0-6
	ALL	Mean Range	71.0 54-81	73.8 57-90	74.8 60-90	73.8 57-90	71.3 54-90	67.8 51-75	70.5 51-81	71.9 51-90
Burwood	1	Mean Range	7.6 0-12	7.6 3-12	7.6 3-9	8.1 3-12	7.8 3-12	8.3 6-12	7.8 3-12	7.8 0-12
	2	Mean Range	21.0 15-30	21.0 15-30	21.2 15-30	21.0 15-30	21.7 15-30	21.5 15-30	21.2 15-30	21.2 15-30
	3	Mean Range	3.9 3-6	4.2 3-9	4.4 3-9	4.4 3-9	4.2 3-9	4.2 3-9	3.9 3-6	4.2 3-9
	4	Mean Range	0 0	0 0	0 0	0 0	0 0	0 0	.2 0-3	.0 0-3
	ALL	Mean Range	32.5 27-36	32.8 27-36	33.2 33-36	33.5 30-36	33.7 30-36	33.9 30-39	33.2 30-36	33.3 27-39
BOTH	1	Mean Range	14.8 6-27	13.0 3-21	13.0 3-21	12.0 9-18	12.0 3-18	11.5 6-18	14.2 6-24	12.9 3-27
	2	Mean Range	67.3 42-84	71.5 42-81	71.8 42-84	70.5 39-84	70.5 39-87	69.3 39-81	68.2 42-87	69.9 39-87
	3	Mean Range	21.3 9-36	20.8 12-36	23.3 12-36	25.0 12-36	23.8 15-39	22.1 12-42	21.5 9-42	22.5 9-42
	4	Mean Range	.5 0-3	1.3 0-6	.8 0-3	.8 0-3	.5 0-3	.5 0-3	.5 0-3	.7 0-6
	ALL	Mean Range	102.8 87-117	106.5 90-123	108.5 93-123	108.3 90-123	106.3 90-123	105.0 93-111	106.1 93-114	106.2 87-123

(i) The above values are obtained by taking 3 times the sample values.

(ii) The values for "all" do not necessarily agree with the corresponding totals.

TABLE 23 EQUIVALENT BEDS IN USE DURING THE SURVEY BY PERCENTAGE OCCUPANCY, HOSPITAL AND TYPE OF ADMISSION

HOSPITAL	TYPE OF ADMISSION	PATIENT DAYS	EQUIVALENT BEDS AT GIVEN OCCUPANCY		
			100%	90%	85%
Christchurch	Emergency	1,315	44.8	49.8	52.7
	Waiting-list	770	26.3	29.2	30.9
	All	2,085	71.1	79.0	83.6
Burwood	Emergency	21	0.7	0.7	0.8
	Waiting-list	993	32.7	36.4	38.5
	All	1,014	33.4	37.1	39.3
BOTH	Emergency	1,336	45.5	50.5	53.5
	Waiting-list	1,763	59.0	65.6	69.4
	ALL	3,099	104.5	116.1	122.9

TABLE 24 EQUIVALENT BEDS IN USE DURING THE SURVEY AT 100% OCCUPANCY BY DEPENDENCY PERIOD, NUMBER AND PERCENTAGE

PERIOD BY STATE OF DEPENDENCY	EQUIVALENT PATIENT DAYS	EQUIVALENT BEDS AT 100% OCCUPANCY		
		TYPE	NUMBER	PERCENTAGE
Category 1 in excess of one day immediately after admission	96	Convalescent	1.2	1.0
Category 1 one day (pre-operation where applicable) to fourth day in Category 2	3,624	Acute	45.4	39.0
Remaining days in Category 2	4,731	Convalescent	59.1	50.9
Category 1 for one day at end of stay	180	Convalescent	2.2	1.9
Category 1 in excess of one day immediately prior to discharge	666	Convalescent	8.2	7.2
ALL	9,297	-	116.1	100

TABLE 25 EQUIVALENT BEDS IN USE DURING THE SURVEY AT 85% OCCUPANCY FOR SHORT-STAY AND LONG-STAY PATIENTS BY HOSPITAL AND AGE-GROUP

HOSPITAL	LENGTH OF STAY	AGE-GROUP (YEARS)		
		13 - 64	65 and over	ALL
Christchurch	Short-stay	52.3	17.9	70.2
	Long-stay	9.7	3.7	13.4
	All	62.0	21.6	83.6
Burwood	Short-stay	5.5	15.3	20.8
	Long-stay	3.5	15.0	18.5
	All	9.0	30.3	39.3
BOTH	Short-stay	57.8	33.2	91.0
	Long-stay	13.2	18.7	31.9
	ALL	71.0	51.9	122.9

TABLE 26 EQUIVALENT BEDS IN USE DURING THE SURVEY AT 85% OCCUPANCY FOR SHORT-STAY PATIENTS BY HOSPITAL, AGE-GROUP AND TYPE OF BED

HOSPITAL	TYPE OF BED	AGE-GROUP (YEARS)		
		13 - 64	65 and over	ALL
Christchurch	Acute	20.8	12.8	33.6
	Convalescent	31.5	5.1	36.6
	All	52.3	17.9	70.2
Burwood	Acute	0.4	2.2	2.6
	Convalescent	5.1	13.0	18.1
	All	5.5	15.2	20.7
BOTH	Acute	21.2	15.0	36.2
	Convalescent	36.6	18.1	54.7
	ALL	57.8	33.1	90.9

TABLE 27 EQUIVALENT BEDS IN USE DURING THE SURVEY AT 85% OCCUPANCY FOR LONG-STAY PATIENTS BY HOSPITAL, AGE-GROUP AND TYPE OF BED

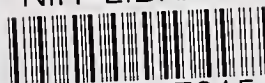
HOSPITAL	TYPE OF BED	AGE-GROUP (YEARS)		
		13 - 64	65 and over	ALL
Christchurch	Acute	4.4	1.4	5.8
	Convalescent	5.3	2.3	7.6
	All	9.7	3.7	13.4
Burwood	Acute	0.1	6.1	6.2
	Convalescent	3.4	9.0	12.4
	All	3.5	15.1	18.6
BOTH	Acute	4.5	7.5	12.0
	Convalescent	8.7	11.3	20.0
	ALL	13.2	18.8	32.0



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